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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

11/12/2010

James Klekotka
Suite 10
4350 W. Chandler Blvd.
Chandler, AZ 85226

EXAMINER

LOPEZ ALVAREZ, OLVIN

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 11/12/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,983	12/17/2003	Masayuki Tomoyasu	071469-0306269 (PC6026A)	6452

TITLE OF INVENTION: METHOD AND SYSTEM FOR PERFORMING A CHEMICAL OXIDE REMOVAL PROCESS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	02/14/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590

11/12/2010

James Klekotka
Suite 10
4350 W. Chandler Blvd.
Chandler, AZ 85226

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,983	12/17/2003	Masayuki Tomoyasu	071469-0306269	6452

TITLE OF INVENTION: METHOD AND SYSTEM FOR PERFORMING A CHEMICAL OXIDE REMOVAL PROCESS (PC6026A)

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	02/14/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
LOPEZ ALVAREZ, OLVIN	2121	700-121000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/736,983	12/17/2003	Masayuki Tomoyasu	071469-0306269 (PC6026A)	6452
7590	11/12/2010		EXAMINER	
			LOPEZ ALVAREZ, OLVIN	
			ART UNIT	PAPER NUMBER
			2121	
DATE MAILED: 11/12/2010				

James Klekotka
Suite 10
4350 W. Chandler Blvd.
Chandler, AZ 85226

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1531 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1531 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/736,983	TOMOYASU ET AL.	
	Examiner	Art Unit	
	OLVIN LOPEZ	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/09/2010.
2. ☒ The allowed claim(s) is/are 1-12,14-16,19-32 and 34-53.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>See Continuation Sheet</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
|---|--|

/ALBERT DECADY/
Supervisory Patent Examiner, Art Unit 2121

Continuation of Attachment(s) 3. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 05/09/2010 , 09/09/2010.

DETAILED ACTION

This office action is in response to **Applicant's arguments filed on September 09, 2010**. Claims 13, 17-18, and 33 have been cancelled. Claims 1-2, 7-8, 10-12, 14, 34-36, and 40 have been amended. Therefore, Claims 1-12, 14-16, and 19-32, and 34-53 are still pending in the present application and in condition of allowance.

Priority

This application claimed the benefit of priority date of U.S. Provisional applications Nos. **60/454597**, **60/454641**, **60/454642**, and **60/454644** filed March 17, 2003, which are incorporated by reference.

Response to Arguments

*Applicant's argument/remarks, on page 17, with respect to rejections to claims 1-2, 12 and 35 **under 35 U.S.C. 112, first paragraph**, have been fully considered and are persuasive. Therefore, rejections to under 35 USC § 112 have been withdrawn due to the amendments.*

Applicant's argument/remarks, on page 20-28, with respect to rejections to claims 1-12, 14-16, and 19-32, and 34-53 under 35 U.S.C. 103(a) have been fully considered and they are persuasive. Therefore, the rejection has been withdrawn and the claims are subject to allowance due to the amendments.

Reasons of Allowance

1. The following is an examiner's statement of reasons for allowance:

As to independent claims 1 and 40 recite “wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data,

creating at least one binning table for a trim amount space extending between a lower boundary to establish a lower limit for trimming achievable by a series of pre-qualified control recipes and an upper boundary to establish an upper limit for trimming achievable by the series of pre-qualified control recipes, said at least one binning table divides said trim amount space into a plurality of bins, each of said plurality of bins has at least one of said pre-qualified control recipes associated therewith that achieves an amount of trimming bounded by a lower trim amount boundary and an upper trim amount boundary ,

correlating a first difference between the isolated CD data and the target CD data and a second difference between the nested CD data and the target CD data with a trim amount,

selecting a bin in said at least one binning table, wherein said trim amount is bounded by said lower trim amount boundary and said upper trim amount boundary for said bin, and

selecting one of said pre-qualified control recipes associated with said bin

as said process recipe", **in combination with the other claimed elements and features is neither taught nor suggested by the prior art of record.**

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Prior art Made of Record

Verbeke et al in (US 20030045131) teaches a method for processing a wafer comprising:

determining a desired state for the substrate, wherein the desired state comprises target critical dimension (CD) data;

receiving pre-process metrology data for the substrate, wherein the pre-process metrology data defines an input state for the substrate and comprises isolated CD data for at least one isolated feature and nested CD data for at least one nested feature;

determining a process recipe for performing a chemical oxide removal (COR) process and a post-heat treatment (PHT) process and processing the substrate to achieve the trim amount using the process recipe, the COR process including chemically treating the substrate by chemically altering exposed surface layers of an oxide hard mask on the substrate and the PHT process including thermally treating the substrate to evaporate the chemically altered exposed surface layers of the oxide hard mask.

However, Verbeke does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Verbeke does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data,

Reiss et al (US 7337019) teaches a system for manufacturing semiconductors by integrating fault detection concepts with run to run control. The system comprises measuring wafer properties, determining a process recipe for performing a manufacturing process on the wafer in a manufacturing tool to maintain the target properties of the wafer at a desired point.

However, Reiss does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Reiss does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data and selecting a recipe based on this comparison.

Shoham et al (US 7042564) teaches a wafer inspection method comprising scanning a reference wafer and generating a gray level map and comparing a further wafer gray level map to determine if an acceptable quality is based on the comparison.

However, Shoham does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Shoham does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data and selecting a recipe based on this comparison.

The reference Ritzdorf (US 20030020928) teaches a methods and an apparatus for processing microelectronic work pieces using metrology comprising determining a desired state for the substrate, wherein the desired state comprises target critical dimension (CD) data;

receiving pre-process metrology data for the substrate, wherein the pre-process metrology data defines an input state for the substrate and comprises isolated CD data for at least one isolated feature and nested CD data for at least one nested feature;

determining a process recipe for performing a chemical oxide removal (COR) process and a post-heat treatment (PHT) process by:

creating a sensitive table/matrix for different processing conditions in a wafer.

processing the substrate to achieve the trim amount using the process recipe, the COR process including chemically treating the substrate by chemically altering exposed surface layers of an oxide hard mask on the substrate and the PHT process including thermally treating the substrate to evaporate the chemically altered exposed surface layers of the oxide hard mask.

However, Ritzdorf does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Ritzdorf does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data and selecting a recipe based on this comparison.

The reference Brown (US 6864041) teaches a method of fabricating a chip comprising determining Isolated and Nested data and controlling line width variations tolerances of the isolated features relative to the nested features while independently achieving a target critical dimension.

However, Brown does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Brown does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data and selecting a recipe based on this comparison.

The reference Bandy et al (US 7060626) teaches a method for forming a wafer comprising determining a desired state for the wafer, etching a wafer, determining a recipe for performing for performing a chemical oxide removal (COR) process and a post-heat treatment (PHT) process, wherein processing of the wafer is different for different areas.

However, Bandy does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Bandy does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data and selecting a recipe based on this comparison.

The reference Bonser (US 6245581) teaches a method and apparatus for controlling critical dimensions comprising:

determining a desired state for the substrate, wherein the desired state comprises target critical dimension (CD) data;

receiving pre-process metrology data for the substrate, wherein the pre-process metrology data defines an input state for the substrate and comprises isolated CD data for at least one isolated feature and nested CD data for at least one nested feature;

determining a process recipe for performing a chemical oxide removal (COR) process and a post-heat treatment (PHT) process by:

However, Bonser does not explicitly teach or suggest the limitations of claims 1 and 40 as cited above. Specifically, Bonser does not teach wherein the isolated CD data is compared to the target CD data and the nested CD data is compared to the target CD data and selecting a recipe based on this comparison.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **OLVIN LOPEZ** whose telephone number is (571)270-7686. The examiner can normally be reached on Mondays thru Thursdays and alternate Fridays from 7:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Albert Decady**, can be reached on (571)-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2121

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/O. L./
Examiner, Art Unit 2121

/ALBERT DECADY/
Supervisory Patent Examiner, Art
Unit 2121